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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,632	11/20/2003	Kazufumi Sato	2003_1687	6339

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EXAMINER

THORNTON, YVETTE C

ART UNIT PAPER NUMBER

1752

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/716,632

Applicant(s)

SATO ET AL.

Examiner

Yvette C. Thornton

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 7, 8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 7-8, 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This is written in reference to application number 10/716,632 filed on November 20, 2003 and published as US 2004/0072103 A1 on April 15, 2004.

#### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

The certified copy has been filed in parent Application No. 09/879894, filed on June 14, 2001.

#### ***Request for Continued Examination***

2. A Request for Continued Examination has been filed on June 9, 2005 in the present application.

An action on the merits follows.

#### ***Response to Amendment***

3. Claims 2-6 and 9 have been cancelled. Claims 1, 7-8 and 10 are currently pending.
4. The amendment to the claims set forth previously is sufficient to overcome the rejection set forth under 35 USC 112 in the office action dated February 9, 2005.

#### ***Claim Rejections- 35 USC 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 7-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatakeyama (US 5750309 A). Hatakeyama teaches a chemically amplified positive resist composition comprising an organic solvent, a resin and a photoacid generator (abstract). The said resin comprises at least two polyhydroxystyrene polymer of given formula (1) having different molecular weights and some of the hydroxyl group are protected by an acid labile group. Suitable acid labile groups include linear or branched alkyl groups having 1-8 carbon atoms (i.e., t-butyl, cyclohexyl); alkoxyalkyl groups of the given

Art Unit: 1752

formula (2) (i.e., ethoxyethyl, t-butoxyethyl); alkoxycarbonyl or alkoxycarbonylalkyl groups of the given formula (3) (i.e., t-butoxycarbonyl); tetrahydropyranyl groups and tetrahydrofuranyl groups (c. 3, l. 16-64). It is the examiner's position that the t-butyl, t-butoxycarbonyl, tetrahydropyranyl, tetrahydrofuranyl, and 1-ethoxyethyl all meet the limitations of instant claim 4. In the given formula (1), the letters p and q are such that  $p/(p+q)$  is at least 0.05 and represents the degree of protective group substitution (c. 3, l. 65-c. 4, l. 2). The resin is at least two polymers having different molecular weights wherein the high molecular weight polymer has a molecular weight dispersity ( $M_w/M_n$ ) of up to 1.5 and the remaining low molecular weight polymer has a dispersity of up to 5.0. The ratio of high molecular weight polymer ( $M_{w1}$ ) to the lower molecular weight polymer ( $M_{w2}$ ) is at least 1.5/1 (c. 1, l. 51-c. 2, l. 14). It is the examiner's position that the said dispersity meets the limitations of the claimed  $M_{wmax}$  to  $M_{wmin}$  requirement of the instant claims when  $M_w/M_n$  (high) and  $M_w/M_n$  (low) are both below 1.5. Further a ratio of  $M_{w1}$  to  $M_{w2}$  of at least 1.5/1 (3/2) clearly falls within the claimed range of 1:9-9:1.

Example E5 exemplifies a high molecular weight resin having a 10% degree of substitution and a low molecular weight resin having 12% degree of substitution. Thereby establishing a polymer mixture wherein one resin has a higher degree of substitution than the other. Each of the said resins have a dispersity of 1:1 (i.e.,  $M_{wmax}:M_{wmin}$ ) and the ratio of high to low is 2:1. A ratio of 2:1 clearly falls within the claimed range of 1:9-9:1 as set forth in the instant claims. Table 1 exemplifies the use of a high molecular weight polymer and a low molecular weight polymer made of the said polymer thereby giving a mixture wherein the same acid labile groups substitute both polyhydroxystyrene resins. Thereby providing motivation for one of ordinary skill in the art to make the acid labile group of the first PHS identical to that of the second PHS.

One of ordinary skill in the art would have been motivated by the teachings of Hatakeyama to develop a photoresist composition comprising at least two different PHS resins having different molecular weights wherein the hydroxyl groups are partially substituted with acid labile groups such as t-butyl, t-

Art Unit: 1752

butoxycarbonyl and ethoxyethyl wherein the high molecular weight resin has a dispersity of up to 1.5; the low molecular weight resin has a dispersity of up to 5.0 and the ratio of high molecular weight resin to low molecular weight resin is at least 1.5/1.

Hatakeyama further teaches that the resist composition may be formulated as a chemically amplified positive resist composition comprising the taught PHS resins, an organic solvent, a photoacid generator and optionally a dissolution inhibitor (c. 4, l. 37-42). The photoacid generator may be selected from well known compounds including onium salts, sulfonates, and diazosulfones. Preferred are onium salts, such as triphenylsulfonium triflate and triphenylsulfonium tosylate (c. 4, l. 66-c. 5, l. 6). Triphenylsulfonium triflate ( $\text{CF}_3\text{SO}_3^-$ ) meets the limitations of an onium salt compound of which the anionic counterpart is a C1 halogenalkylsulfonate anion as set forth in instant claim 1. Hatakeyama also teaches that the said composition may further contain various additives such as nitrogenous compound for improving environmental stability. Typical examples include amine and amide compounds having a boiling point of 150 degrees or higher (c. 5, l. 19-40). The said nitrogenous compound meets the limitations of the claimed amine compound.

#### *Response to Arguments*

7. Applicant's arguments have been fully considered, but are of little moment in light of the new grounds of rejections.

#### *Conclusion*

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 571-272-1336. The examiner can normally be reached on Monday-Thursday 8-6:30.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1752

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yvette Clarke Thornton  
Primary Examiner  
Art Unit 1752

yct  
June 27, 2005

A handwritten signature in black ink, appearing to read "Yvette Clarke Thornton", written in a cursive style.